PCI8753

User's Manual

Beijing ART Technology Co., Ltd.

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Chapter 1 Overview

In the fields of Real-time Signal Processing, Digital Image Processing and others, high-speed and high-precision data acquisition modules are demanded. ART PCI8753 data acquisition module, which brings in advantages of similar products that produced in china and other countries, is convenient for use, with high performance-price ratio.

ART PCI8753 is a data acquisition module based on PCI bus. It can be directly inserted into IBM-PC/AT or a computer which is compatible with PCI8753 to constitute the laboratory, product quality testing center and systems for different areas of data acquisition, waveform analysis and processing. It may also constitute the monitoring system for industrial production process.

Unpacking Checklist

Check the shipping carton for any damage. If the shipping carton and contents are damaged, notify the local dealer or sales for a replacement. Retain the shipping carton and packing material for inspection by the dealer.
Check for the following items in the package. If there are any missing items, contact your local dealer or sales.

- PCI8753 Data Acquisition Board
- ART Disk
  a) user's manual (pdf)
  b) drive
  c) catalog
- Warranty Card

FEATURES

AD analog input

- Input Range: ±10V, ±5V, ±2.5, 0～10V, 0～5V
- 16-bit resolution
- Sampling Rate: up to 250KS/s
- Analog Input Mode: 32SE/16DI
- AD Conversion Time: ≤10uS
- Programmable Gain: 1, 2, 4, 8 times (AD8251)or 1, 2, 5, 10 times (AD8250) or 1, 10, 100, 1000 times (AD8253)
- Analog Input Impedance: 10MΩ
- Amplifier Set-up Time: 785nS(0.001%)(max)
- Non-linear error: ±3LSB(Maximum)
- System Measurement Accuracy: 0.01%
- Operating Temperature Range: 0℃ ～ 55℃
- Storage Temperature Range: －20℃ ～ 70℃

DI digital input

- Channel No.: 16-channel
- Electric Standard: TTL compatible
- High Level: ≧2V

- Low Level: ≦0.8V

DO digital output

- Channel No.: 16-channel
- Electrical Standard: TTL compatible
- High Level: ≧3.8V
- Low Level: ≦0.44V
- Power-on Reset

Other features

On-board Clock Oscillator: 40MHz

Chapter 2 Components Layout Diagram and a Brief Description

2.1 The Main Components Layout Diagram

2.2 The Function Description of the Main Components

2.2.1 Signal Input and Output Connectors

CN1: analog signal input and output connectors
P1: on/off input signal port
P2: on/off output signal port

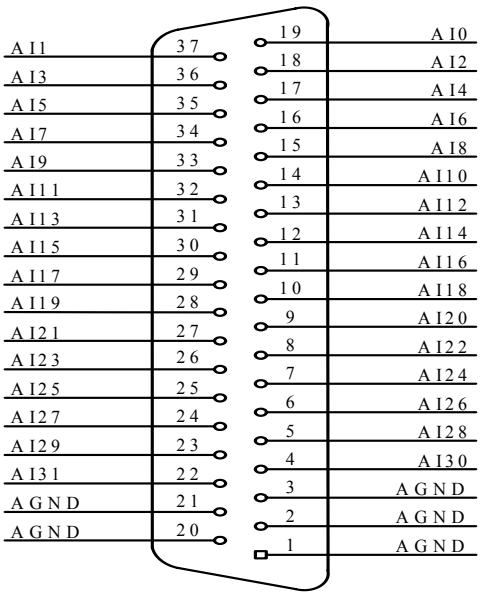
2.2.2 Potentiometer

RP1: AD analog signal input zero point adjustment potentiometer
RP2: AD analog signal input full-scale adjustment potentiometer

Chapter 3 Signal Connectors

3.1 The Definition of Signal Input Connectors

37 core plug on the CN1 pin definition

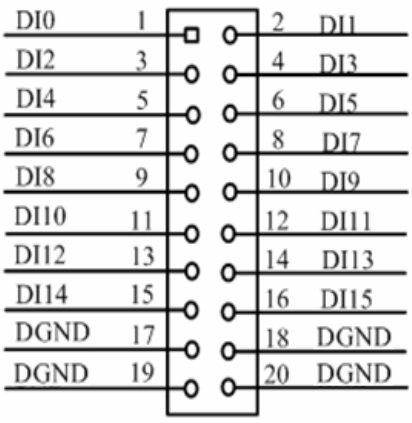


CN1 pins definition

Signal Name	Type	Function Definition
AI0～AI31	Input	AD analog signal input pins.
AGND	GND	Analog signal ground, input/output signal uses it as reference ground.

3.2 DI Definition of Signal Input and Output Connectors

20 core plug P1 pin definition

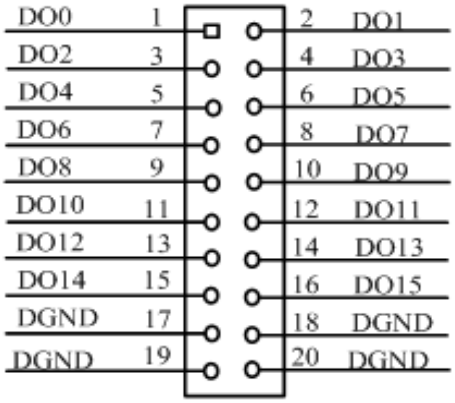


P1 pins definition

Signal Name	Type	Function Definition
DI0-DI15	Input	Digital signal input pins, DGND for reference ground.
DGND	GND	Digital signal ground

3.3 DO Definition of Signal Input and Output Connectors

20 core plug P2 pin definition



P2 pins definition

Signal Name	Type	Function Definition
DO0-DO15	Output	Digital signal input pins, DGND for reference ground.
DGND	GND	Digital signal ground

Chapter 4 Connection Ways for Each Signal

4.1 AD Single-ended Input Connection

Single-ended mode can achieve a signal input by one channel, and several signals use the common reference ground. This mode is widely applied in occasions of the small interference and relatively many channels.

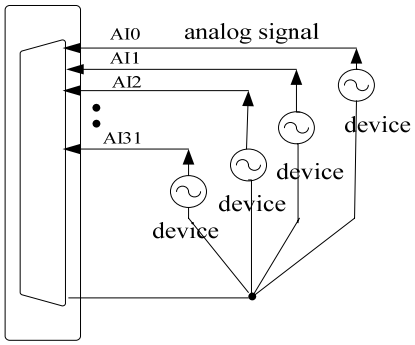


Figure 4.1 single-ended input connection

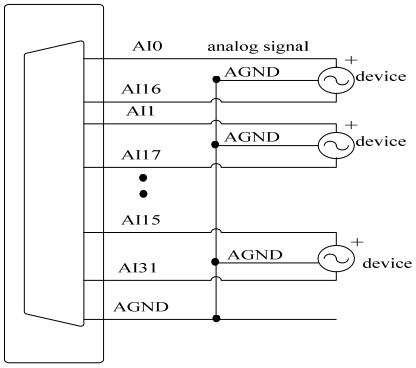


Figure 4.2 double-ended input connection

4.2 AD Double-ended Input Mode

Double-ended input mode, which was also called differential input mode, uses positive and negative channels to input a signal. This mode is mostly used when biggish interference happens and the channel numbers are few. Single-ended/double-ended mode can be set by the software, please refer to PCI8753 software manual.

According to the diagram below, PCI8753 board can be connected as analog voltage double-ended input mode, which can effectively suppress common-mode interference signal to improve the accuracy of acquisition. Positive side of the 16-channel analog input signal is connected to AI0~AI15, the negative side of the analog input signal is connected to AI16~AI31, equipments in industrial sites share the AGND with PCI8753 board

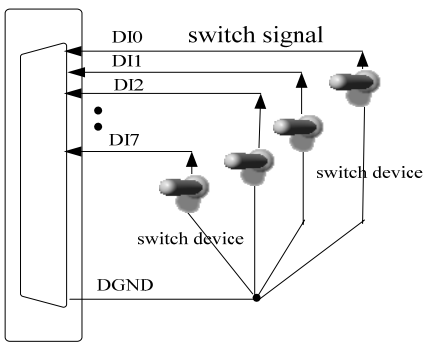


Figure 4.3 digital signal input connection

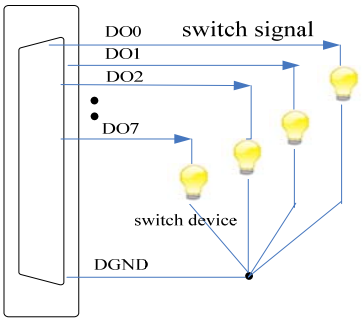


Figure 4.4 digital signal output connection

Chapter 5 Notes, Calibration and Warranty Policy

5.1 Notes

In our products' packing, user can find a user manual, a PCI8753 module and a quality guarantee card. Users must keep quality guarantee card carefully, if the products have some problems and need repairing, please send products together with quality guarantee card to ART, we will provide good after-sale service and solve the problem as quickly as we can.

When using PCI8753, in order to prevent the IC (chip) from electrostatic harm, please do not touch IC (chip) in the front panel of PCI8753 module.

5.2 AD Analog Signal Input Calibration

Every device has to be calibrated before sending from the factory. It is necessary to calibrate the module again if users want to after using for a period of time or changing the input range. PCI8753 default input range: ±10V, in the manual, we introduce how to calibrate PCI8753 in ±10V, calibrations of other input ranges are similar.

Prepare a digital voltage instrument which the resolution is more than 5.5 bit, install the PCI8753 module, and then power on, warm-up for fifteen minutes.

1) Zero adjustment: select one channel of analog inputs, take the channel AI0for example, connect 0V to AI0, and then run ART Data Acquisition Measurement Suite in the WINDOWS. Choose channel 0, ±10V input range and start sampling, adjust potentiometer RP1 in order to make voltage value is 0.000V or about 0.000V. Zero adjustment of other channels is alike.
2) Full-scale adjustment: select one channel of analog inputs, take the channel AI0 for example, connect 9999.69mV to AI0, and then run ART Data Acquisition Measurement Suite in the WINDOWS. Choose channel 0, ±10V input range and start sampling, adjust potentiometer RP2 in order to make voltage value is 9999.69mV or about 9999.69mV. Full-scale adjustment of other channels is alike.
3) Repeat steps above until meet the requirement.

5.3 DA Analog Signal Output Calibration

In the manual, we introduce how to calibrate PCI8753 in ±10V input range; calibrations of other input ranges are similar.

1）Connect the ground of the digital voltage meter to any analog AGND of the CN162 core D-type plug. Connect the input side of the voltage meter to the DA input channel which needs calibration. Run PCI8753 test procedure under Windows, select the DA output detection.

2) By adjusting the DA reference voltage to adjust potentiometer RP3 in order to make pin 6 of U29 output -2.5V.

3）To set DA output is 10V, adjust potentiometer RP4 in order to make AO0 output voltage value is 9995.11mV (adjust potentiometer RP5～RP7 to make AO1～AO3 output value is 9995.11mV).

4）Repeat steps above until meet the requirement.

5.4 DA use

In demonstration program, the continuous output interval of waveform output can not be carried out; the main objective is to test the strength of DA output.

5.5 Warranty Policy

Thank you for choosing ART. To understand your rights and enjoy all the after-sales services we offer, please read the following carefully.

1. Before using ART's products please read the user manual and follow the instructions exactly. When sending in damaged products for repair, please attach an RMA application form which can be downloaded from: www.art-control.com.
2. All ART products come with a limited two-year warranty:
   - The warranty period starts on the day the product is shipped from ART's factory
   - For products containing storage devices (hard drives, flash cards, etc.), please back up your data before sending them for repair. ART is not responsible for any loss of data.
   - Please ensure the use of properly licensed software with our systems. ART does not condone the use of pirated software and will not service systems using such software. ART will not be held legally responsible for products shipped with unlicensed software installed by the user.
3. Our repair service is not covered by ART's guarantee in the following situations:
   - Damage caused by not following instructions in the User's Manual.
   - Damage caused by carelessness on the user's part during product transportation.
   - Damage caused by unsuitable storage environments (i.e. high temperatures, high humidity, or volatile chemicals).
   - Damage from improper repair by unauthorized ART technicians.
   - Products with altered and/or damaged serial numbers are not entitled to our service.
4. Customers are responsible for shipping costs to transport damaged products to our company or sales office.
5. To ensure the speed and quality of product repair, please download an RMA application form from our company website.

Products Rapid Installation and Self-check

Rapid Installation

Product-driven procedure is the operating system adaptive installation mode. After inserting the disc, you can select the appropriate board type on the pop-up interface, click the button【driver installation】; or select CD-ROM drive in Resource Explorer, locate the product catalog and enter into the APP folder, and implement Setup.exe file. After the installation, pop-up CD-ROM, shut off your computer, insert the PCI card. If it is a USB product, it can be directly inserted into the device. When the system prompts that it finds a new hardware, you do not specify a drive path, the operating system can automatically look up it from the system directory, and then you can complete the installation.

Self-check

At this moment, there should be installation information of the installed device in the Device Manager (when the device does not work, you can check this item.). Open "Start -> Programs -> ART Demonstration Monitoring and Control System -> Corresponding Board -> Advanced Testing Presentation System", the program is a standard testing procedure. Based on the specification of Pin definition, connect the signal acquisition data and test whether AD is normal or not. Connect the input pins to the corresponding output pins and use the testing procedure to test whether the switch is normal or not.

Delete Wrong Installation

When you select the wrong drive, or viruses lead to driver error, you can carry out the following operations: In Resource Explorer, open CD-ROM drive, run Others-> SUPPORT-> PCI. bat procedures, and delete the hardware information that relevant to our boards, and then carry out the process of section I all over again, we can complete the new installation.